Goals and Timeline

- Integrate containers in the CERN cloud
  - Shared identity, networking integration, storage access, …
- Agnostic to container orchestration engines
  - Docker Swarm, Kubernetes, Mesos
- Fast, easy to use

CERN / HEP Service Integration, Networking, CVMFS, EOS

- Container Investigations
- Magnum Tests
- Upstream Development
- Pilot Service Deployed
- Production Service

- 11 / 2015
- 02 / 2016
- 10 / 2016
Use Cases

- Example: Spark on Mesos

```bash
$ magnum cluster-create --name myspark --cluster-template mesos --node-count 20

$ magnum cluster-show myspark | grep api_address
  api_address | 137.138.7.77 |

$ spark-shell --master mesos://zk://137.138.7.77:2181/mesos
scala> val NUM_SAMPLES = 1000
   val count = sc.parallelize(1 to NUM_SAMPLES).map{i =>
       val x = Math.random()
       val y = Math.random()
       if (x*x + y*y < 1) 1 else 0
   }.reduce(_ + _)
println("Pi is roughly " + 4.0 * count / NUM_SAMPLES)
Pi is roughly 3.142532
```
Performance

- Second try (Aug 2016)
  - Much **better latency**
  - Managed **7 million requests / sec**
- And an analysis of cluster deployments

<table>
<thead>
<tr>
<th>Cluster Size (Nodes)</th>
<th>Deployment Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.5</td>
</tr>
<tr>
<td>32</td>
<td>4</td>
</tr>
<tr>
<td>128</td>
<td>5.5</td>
</tr>
<tr>
<td>512</td>
<td>14</td>
</tr>
<tr>
<td>1000</td>
<td>23</td>
</tr>
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